



"Pragmatically, a way to begin would be to set up a capability in government to budget according to flows of energy rather than money. Energy is the all-pervasive underlying currency of our society."

U.S. Senator Mark Hatfield -- 1974

A PROGRAM

By William Knight

The late William Knight, member of Technocracy Inc., an aeronautical engineer and one time associate of Charles P. Steinmetz, compiled the following program decades before Senator Mark Hatfield's suggestion.

It is proposed to organize a "National Advisory Committee on Social and Technological Trends" composed of American Scientists, Engineers, and Technologists, who are competent to undertake and are in sympathy with the work outlined below. It is also proposed that, once this Committee has been organized, it take the initiative in bringing about the organization of similar committees in the United States or outside of the United States, each composed of Scientists, Engineers, and Technologists of the major nations of the world. The object of these National Advisory Committees shall be to cooperate in a research work undertaken by an "International Advisory Board on Social and Technological Trends" composed of the membership of all National Advisory Committees. The objective of this International Board shall be to conduct a survey, the scope of which is briefly stated as follows:

1. To investigate the order of magnitude and the rate of scientific discovery and technological progression achieved during the last one hundred and fifty years and find out, with particular reference to each continental area of the world, whether or not the corresponding evolution of the social-economic mechanism of production and distribution of all goods and services in each continental area has progressed at the maximum possible rate compatible with the physical set-up of climatic conditions, mineral resources and population existing in that area. If not, specify the causes of such a lag in each continent.
2. To find out whether or not, and to what extent, the ever increasing use of extraneous energy (extraneous to the muscular energy conversion mechanism of humans and domesticated animals) which has taken place during the last one

hundred and fifty years, dictates today the mode of operation of a social mechanism. If so, define its basic operating characteristics.

3. To define to what extent and within which limits of energy conversion rates, and the rate of depletion of non-replaceable natural resources, the operating characteristics mentioned above can be partially or totally ignored, for a time, by one or all political divisions of a continental area, without impairing the continuity of the operation of the social mechanism of that continental area and the stability of the social institutions of all continental areas of the world.
4. On the basis of the physical set-up of soil and solar radiation, fish life, mineral resources, the technological equipment already built, the technically trained personnel available, and the rate of energy conversion prevailing in any continental area, outline the form of social controls best adapted to each continental area for the production of the largest possible flow of goods and services to its present population, with the most efficient continuous operation of its technological equipment and the least possible waste of irreplaceable natural resources and human effort. Compare the flow of goods and services possible under this hypothetical form of social controls and the flow of goods and services possible under any other known form of society.
5. *To find out whether or not the present economic system, based upon the use of a currency measured in terms of a commodity (gold, silver, paper, etc.) entirely unrelated to the physical process of production and distribution, and endowed with an arbitrary and variable exchange value, can be so amended as to provide, at any time and at any place, an accurate and uniform measurement of the physical cost of production and distribution of any and all goods and services, a cost exclusively based upon the exact measurement of the energy degraded in the technological process of production and distribution used. If not, design an economic system and a currency that will do so. This currency shall provide an accurate measurement of production and distribution costs of any and all goods and services produced in any continental area. It shall also provide a means of predetermining the social usefulness of technological changes and the reaction of such changes upon the internal economy of a continent and its foreign trade.*
6. To determine the surplus of natural resources (in excess of local consumption) and the surplus of goods and services most efficiently originated in any continental area, with its present technological equipment, which could be exported to or from other continental areas, and specify the basic characteristics of a uniform international medium of exchange in foreign trade between continental areas using different technological standards of production and distribution.
7. To originate any type of research work bearing upon the physical operation of the social mechanism (both national and international) that, in their estimation, is conducive to the collection and to the widest possible dissemination of pertinent data and information leading to a better popular understanding of the operating laws of a modern social mechanism and a clear vision of what Science and Engineering can do towards eliminating, insofar as this is humanly possible, the present economic insecurity which is the paramount motivating cause of fear, hate,

misery and crime, racial antagonisms, religious intolerance, international aggressions, revolutions and wars.

It is fully realized that the program embodied in the above paragraphs emphasizes the urgency of a detailed study of the physical operating characteristics of modern society, whereas the human equation has been almost entirely disregarded. The reason for this is that, if it is conceded that since approximately the beginning of the last century, the evolution of social institutions in highly industrialized nations has lagged, more or less, behind the evolution of scientific and technological progress, and if it is conceded that the present world unrest is mostly—if not totally—due to this lag, it becomes imperative for us, before we reach the limit of social intolerance—when the very foundation of our present civilization would be endangered—that we specify first the limit of this lag behind which we cannot go, also the structural changes that should be introduced in the design of our social mechanism in order to bring about the most harmonious operation of our social controls and the operation of our ever expanding scientific discovery and technological changes. Between these two theoretical limits lies the practical solution of our present troubles. A clear knowledge of these two extreme limits should guide statesmen, legislators, educators, businessmen, financiers, and molders of public opinion of all nations. This knowledge is not available today.

If there are technological trends responsible to a large extent for the behavior of individuals, national entities and racial groups, we cannot much longer ignore the fact that our modern civilization—that on the North American Continent is characterized by the largest rate of degradation of energy, which in the U.S.A., is rapidly approaching the order of magnitude of 200,000 Kilogram-Calories per capita and per day—cannot be made to function much longer according to our wishes and beliefs only. There must be some limiting conditions making it possible for us to indulge forever in a wishful regulation of national policies and international relations, unless we harmonize them with modern technological trends.

If it is conceded that we have developed an entirely new type of civilization in which the work of the world is increasingly being done by the conversion of stored up solar energy—which no previous generation of men knew how to use—if this civilization is to endure, we must primarily concern ourselves, at the present time, with a thorough understanding of the social effects of a large and ever increasing use of energy upon the stability of slow-changing institutions—which is the province of Scientists and Engineers—before intangible spiritual, intellectual and emotional forces, equally responsible for the molding of modern society, can be studied in their true relationship to technological causes and their social effect—which is not the province of Scientists and Engineers. If this is the case, we must first approach the operating problem of modern society with the same methodology that we employ in the study of all scientific and engineering problems. In order to do so in the proposed investigation, it was necessary to specify a method of evaluation of all goods and services produced, based exclusively upon the energy degraded in the particular technological process of production and distribution used. This and only this is the true physical cost of anything produced by any civilization at any time and anywhere.

An attempt was made to outline the present program in such a manner that the conclusions arrived at could be colored the least with feelings, beliefs, and philosophical preconceptions of Scientists and Engineers. A basic assumption had to be made when outlining this program, and this was that ethnologically related human beings living in continental areas of the world, where far reaching social changes are impending—such as North America and South America, Europe, Russia, India, Asia, Africa, and Oceania, if they are going to plan at all a new social order, the planning must be done with a full understanding of the natural resources available on each continent, and must be endemic to the scientific and technological knowledge that the inhabitants of each continent have been able to master and to apply.

Science, which concerns itself with the determination of the next most probably state in any field of knowledge, be it chemistry, engineering or social phenomena, may well be able to answer some of the most perplexing questions on the immediate future ahead of us. The object of this Social-Engineering program of research and design is to obtain a timely answer to these questions from those who are most responsible for the momentous changes which have taken place in our social environment during the last one hundred and fifty years, and especially since the beginning of this century. They must point out to us the general directions that we must fatally follow from now on in the pursuit of national and international policies, if a destructive clash of these policies with modern technological trends is to be avoided. It may be already too late for the proposed action to be effective. However, one must try, up to the very end, to save the type of civilization that Science and Engineering have given to us. In this spirit the program of social action was prepared. In this spirit the cooperation of all who are in sympathy with it is requested.